UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,322	03/12/2004	Elias Jonsson	4015-5191	8194

24112 7590 05/10/2007		EXAMINER
COATS & BENNETT, PLLC		FLORES, LEON
1400 Crescent Green, Suite 300		
Cary, NC 27518		

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
05/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/799,322	JONSSON, ELIAS
	Examiner	Art Unit	
	Leon Flores	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -- .

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>12 March 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-47</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-47</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>12 March 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>12/3/2004</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)   Office Action Summary   Part of Paper No./Mail Date 20070416

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   **Claims (1-47) rejected under 35 U.S.C. 102(b) as being anticipated by**

Bottomley et al (hereinafter Bottomley), *"A Generalized RAKE Receiver for*

***Interference Suppression"*, IEEE Journal on selected areas in communications,**

Vol. 18, No. 8, August 2000.

Re claim 1, Bottomley discloses a method of determining received signal quality

for a received signal in an inter-symbol interference canceling receiver comprising:

generating an estimate of inter-symbol interference in the received signal (See section

III: B, "Combining weights and finger delays".); scaling the estimated inter-symbol

interference by a cancellation metric comprising a scalar value corresponding to inter-

symbol interference cancellation performance of the receiver (See section III: B,

"Combining weights and finger delays".); and estimating the received signal quality

based on the scaled estimate of inter-symbol interference. (See section IV)

Re claim 2, Bottomley further discloses that wherein estimating the received

signal quality based on the scaled estimate of inter-symbol interference comprises

estimating a signal-to-interference ratio of the received signal. (See section IV)

Re claim 3, Bottomley further discloses that periodically estimating the signal-to-interference ratio of the received signal and periodically transmitting corresponding channel quality information to a supporting wireless communication network. (See section I & IV. Furthermore, one skilled in the art would know that WCDMA require mobile terminals to compute received signal quality and transmit TCP commands back to the Base station.)

Re claim 4, Bottomley further discloses that periodically estimating the signal-to-interference ratio of the received signal, generating corresponding link power control commands, and transmitting the link power control commands to a supporting wireless communication network. (See section I & IV. Furthermore, one skilled in the art would know that WCDMA require mobile terminals to compute received signal quality and transmit TCP commands back to the Base station.)

Re claim 5, Bottomley further discloses that storing the cancellation metric in a memory of the receiver as a pre-configured value. (See section III. The combining weights are derived from maximum likelihood (ML) principles. One skilled in the art would know that an equalizer, in this case, would be a maximum-likelihood sequence estimator implemented by use of the Viterbi algorithm or a decision feedback equalizer.

And this equalizer is capable of suppressing ISI by adaptively updating its tap coefficients stored in the tapped-delay line in the equalizer.

Re claim 6, Bottomley further discloses that determining the pre-configured value of the cancellation metric by characterizing inter-symbol interference cancellation performance of the receiver, or of a same type of receiver. (See section III. The combining weights are derived from maximum likelihood (ML) principles. One skilled in the art would know that an equalizer, in this case, would be a maximum-likelihood sequence estimator implemented by use of the Viterbi algorithm or a decision feedback equalizer. And this equalizer is capable of suppressing ISI by adaptively updating its tap coefficients stored in the tapped-delay line in the equalizer.

Re claim 7, Bottomley further discloses that maintaining the cancellation metric as a dynamically updated value based on inter-symbol interference cancellation performance of the receiver as measured during operation. (See section III: B, "Combining weights and finger delays".)

Re claim 8, Bottomley further discloses that wherein the received signal comprises a WCDMA Dedicated Physical Channel (DPCH) signal, and wherein determining received signal quality for a received signal in an inter-symbol interference canceling receiver comprises, for each timeslot of the DPCH signal, estimating the received signal quality based on the scaled estimate of inter-symbol interference,

generating a corresponding transmit power control command, and transmitting the

power control command to a supporting WCDMA network. (See section I & IV.

Furthermore, one skilled in the art would know that WCDMA require mobile terminals to

compute received signal quality and transmit TCP commands back to the Base station.)

Re claim 9, Bottomley further discloses that, wherein generating an estimate of

inter-symbol interference in the received signal comprises generating an expected value

of the inter-symbol interference in the received signal. (See section III: B, "Combining

weights and finger delays".)

Re claim 10, Bottomley further discloses that, wherein scaling the estimated

inter-symbol interference by a cancellation metric comprising a scalar value

corresponding to inter-symbol interference cancellation performance of the receiver

comprises multiplying the expected value of the inter-symbol interference by the

cancellation metric, or by a ratio of the cancellation metric. (See section III: B,

"Combining weights and finger delays".)

Re claim 11, Bottomley further discloses that, wherein estimating the received

signal quality based on the scaled estimate of inter-symbol interference comprises

estimating a received signal power for the received signal, estimating an additional

impairment component of the received signal corresponding to other than inter-symbol

interference, and calculating the signal-to-interference ratio of the received signal as a

ratio of the received signal power over a sum of the scaled estimate of inter-symbol

interference and the additional impairment component. (See section III: B, "Combining

weights and finger delays".)

Re claim 12, Bottomley further discloses that, wherein the received signal power,

the scaled estimate of inter-symbol interference, and the additional impairment

component, are estimated using combined values corresponding to RAKE fingers in the

receiver that are associated with the received signal. (See section III: B, "Combining

weights and finger delays".)

Re claim 13, Bottomley further discloses that, wherein estimating a received

signal power for the received signal comprises calculating the received signal power

based on the magnitudes of net channel responses and signal amplitudes for

propagation paths associated with the received signal. (See section III: B, "Combining

weights and finger delays".)

Re claim 14, Bottomley further discloses that, wherein estimating an additional

impairment component of the received signal corresponding to other than inter-symbol

interference comprises estimating an interference variance based on received pilot

channel symbols. (See section III: B, "Combining weights and finger delays".)

Re claim 15, Bottomley further discloses that storing a cancellation metric for each of one or more supporting network transmitters, and wherein scaling the estimated inter-symbol interference by a cancellation metric comprising a scalar value corresponding to inter-symbol interference cancellation performance of the receiver comprises scaling an estimated inter-symbol interference estimate for each of the one or more network transmitters by the corresponding cancellation metric. (See section III: B, "Combining weights and finger delays". & figure 2)

Re claim 16, Bottomley further discloses that determining the cancellation metric based on generating a combined estimate for inter-symbol interference and other impairment in the received signal and removing a noise variance estimate corresponding to the other impairment from the combined estimate to obtain the cancellation metric. (See section III: B, "Combining weights and finger delays".)

Claim 17 is a system claim corresponding to method claim 1. Hence, the steps performed in method claim 1 would have necessitated the elements in system claim 17. Therefore, claim 17 has been analyzed and rejected w/r to claim 1.

Claim 18 is a system claim corresponding to method claim 2. Hence, the steps performed in method claim 2 would have necessitated the elements in system claim 18. Therefore, claim 18 has been analyzed and rejected w/r to claim 2.

Claim 19 is a system claim corresponding to method claim 3. Hence, the steps performed in method claim 3 would have necessitated the elements in system claim 19. Therefore, claim 19 has been analyzed and rejected w/r to claim 3.

Claim 20 is a system claim corresponding to method claim 4. Hence, the steps performed in method claim 4 would have necessitated the elements in system claim 20. Therefore, claim 20 has been analyzed and rejected w/r to claim 4.

Claim 21 is a system claim corresponding to method claim 5. Hence, the steps performed in method claim 5 would have necessitated the elements in system claim 21. Therefore, claim 21 has been analyzed and rejected w/r to claim 5.

Claim 22 is a system claim corresponding to method claim 7. Hence, the steps performed in method claim 7 would have necessitated the elements in system claim 22. Therefore, claim 22 has been analyzed and rejected w/r to claim 7.

Claim 23 is a system claim corresponding to method claim 8. Hence, the steps performed in method claim 8 would have necessitated the elements in system claim 23. Therefore, claim 23 has been analyzed and rejected w/r to claim 8.

Claim 24 is a system claim corresponding to method claim 9. Hence, the steps performed in method claim 9 would have necessitated the elements in system claim 24. Therefore, claim 24 has been analyzed and rejected w/r to claim 9.

Claim 25 is a system claim corresponding to method claim 10. Hence, the steps performed in method claim 10 would have necessitated the elements in system claim 25. Therefore, claim 25 has been analyzed and rejected w/r to claim 10.

Claim 26 is a system claim corresponding to method claim 11. Hence, the steps performed in method claim 11 would have necessitated the elements in system claim 26. Therefore, claim 26 has been analyzed and rejected w/r to claim 11.

Claim 27 is a system claim corresponding to method claim 12. Hence, the steps performed in method claim 12 would have necessitated the elements in system claim 27. Therefore, claim 27 has been analyzed and rejected w/r to claim 12.

Re claim 28, Bottomley further discloses that wherein the processing circuit comprises at least a portion of an integrated circuit device that is arranged and configured for baseband signal processing in a wireless communication receiver. (See fig. 2)

Claim 29 is a system claim corresponding to method claim 15. Hence, the steps performed in method claim 15 would have necessitated the elements in system claim 29. Therefore, claim 29 has been analyzed and rejected w/r to claim 15.

Re claim 30, Bottomley further discloses that, wherein the one or more supporting network transmitters are associated with different network cells, and wherein the processing circuit estimates and scales inter-symbol interference on a per cell basis. (See section III: B, "Combining weights and finger delays".)

Claim 29 is a system claim corresponding to method claim 15. Hence, the steps performed in method claim 15 would have necessitated the elements in system claim 29. Therefore, claim 29 has been analyzed and rejected w/r to claim 15.

Claim 31 is a system claim corresponding to method claim 1. Hence, the steps performed in method claim 1 would have necessitated the elements in system claim 31. Therefore, claim 31 has been analyzed and rejected w/r to claim 1. Furthermore, the system described in this reference is a CDMA-based system.

Claim 32 is a system claim corresponding to method claim 2. Hence, the steps performed in method claim 2 would have necessitated the elements in system claim 32. Therefore, claim 32 has been analyzed and rejected w/r to claim 2.

Claim 33 is a system claim corresponding to method claim 3. Hence, the steps performed in method claim 3 would have necessitated the elements in system claim 33. Therefore, claim 33 has been analyzed and rejected w/r to claim 3.

Claim 34 is a system claim corresponding to method claim 4. Hence, the steps performed in method claim 4 would have necessitated the elements in system claim 34. Therefore, claim 34 has been analyzed and rejected w/r to claim 4.

Claim 35 is a system claim corresponding to method claim 5. Hence, the steps performed in method claim 5 would have necessitated the elements in system claim 35. Therefore, claim 35 has been analyzed and rejected w/r to claim 5.

Claim 36 is a system claim corresponding to method claim 7. Hence, the steps performed in method claim 7 would have necessitated the elements in system claim 36. Therefore, claim 36 has been analyzed and rejected w/r to claim 7.

Claim 37 is a system claim corresponding to method claim 8. Hence, the steps performed in method claim 8 would have necessitated the elements in system claim 37. Therefore, claim 37 has been analyzed and rejected w/r to claim 8.

Claim 38 is a system claim corresponding to method claim 9. Hence, the steps performed in method claim 9 would have necessitated the elements in system claim 38. Therefore, claim 38 has been analyzed and rejected w/r to claim 9.

Claim 39 is a system claim corresponding to method claim 10. Hence, the steps performed in method claim 10 would have necessitated the elements in system claim 39. Therefore, claim 39 has been analyzed and rejected w/r to claim 10.

Claim 40 is a system claim corresponding to method claim 11. Hence, the steps performed in method claim 11 would have necessitated the elements in system claim 40. Therefore, claim 40 has been analyzed and rejected w/r to claim 11.

Claim 41 is a system claim corresponding to method claim 12. Hence, the steps performed in method claim 12 would have necessitated the elements in system claim 41. Therefore, claim 41 has been analyzed and rejected w/r to claim 12.

Claim 40 is a system claim corresponding to method claim 11. Hence, the steps performed in method claim 11 would have necessitated the elements in system claim 40. Therefore, claim 40 has been analyzed and rejected w/r to claim 11.

Re claim 42, Bottomley further discloses that, wherein the device comprises a mobile terminal configured for operation in a WCDMA wireless communication network,

and wherein the device is configured to determine the received signal quality via use of

the processing circuit for one or more received WCDMA signal transmitted by the

network. (See section I & IV. Furthermore, one skilled in the art would know that

WCDMA require mobile terminals to compute received signal quality and transmit TCP

commands back to the Base station.)

Re claim 43, Bottomley further discloses that, wherein the mobile terminal is

configured periodically to report Channel Quality Information for a High Speed Packet

Data Service signal transmitted by the network based on determining received signal

quality for the signal via the processing circuit. (See section I & IV. Furthermore, one

skilled in the art would know that WCDMA require mobile terminals to compute received

signal quality and transmit TCP commands back to the Base station.)

Re claim 44, Bottomley further discloses that, wherein the mobile terminal is

configured periodically to transmit forward link power control commands to the network

based on determining received signal quality via the processing circuit for one or more

WCDMA signals transmitted by the network. (See section I & IV. Furthermore, one

skilled in the art would know that WCDMA require mobile terminals to compute received

signal quality and transmit TCP commands back to the Base station.)

Claim 45 has been analyzed and rejected w/r to claim 1 above. Furthermore, the steps performed in method claim 1 would have necessitated a computer readable medium to store the computer program or instructions.

Claim 46 has been analyzed and rejected w/r to claim 11 above. Furthermore, the steps performed in method claim 11 would have necessitated a computer readable medium to store the computer program or instructions.

Claim 47 has been analyzed and rejected w/r to claim 12 above. Furthermore, the steps performed in method claim 12 would have necessitated a computer readable medium to store the computer program or instructions.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.

    4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

5.   **Claims (5-6, 21, 35) are rejected under 35 U.S.C. 103(a) as being unpatentable over Bottomley et al (hereinafter Bottomley), *"A Generalized RAKE Receiver for Interference Suppression"*, IEEE Journal on selected areas in communications, Vol. 18, No. 8, August 2000, as applied to claim 1 above, and further in view of Jasper et al (hereinafter Jasper) (US Patent 6,441,786 B1).**

Re claim 5, the reference of Bottomley fails to specifically disclose storing the cancellation metric in a memory of the receiver as a pre-configured value.

However, Jasper does. (See col. 10, lines 20-22) Jasper discloses storing the cancellation metric (See equations 1 or 11 or 13) in a memory of the receiver as a pre-configured value. (See col. 10, lines 20-22)

Therefore, taking the combined teachings of Bottomley and Jasper as a whole. It would have been obvious to one of ordinary skill in the art to have incorporated this feature into the system of Bottomley, in the manner as claimed, and as taught by Jasper, for the benefit of suppressing interference in the receiver.

Re claim 6, the combination of Bottomley and Jasper further discloses determining the pre-configured value of the cancellation metric by characterizing inter-symbol interference cancellation performance of the receiver, or of a same type of receiver. (In Jasper, see equation 1)

Claim 21 is a system claim corresponding to method claim 5. Hence, the steps performed in method claim 5 would have necessitated the elements in system claim 21. Therefore, claim 21 has been analyzed and rejected w/r to claim 5.

Claim 35 is a system claim corresponding to method claim 5. Hence, the steps performed in method claim 5 would have necessitated the elements in system claim 35. Therefore, claim 35 has been analyzed and rejected w/r to claim 5.

Claims (5-6, 21, 35) are rejected under 35 U.S.C. 103(a) as being unpatentable over Bottomley et al (hereinafter Bottomley), "A Generalized RAKE Receiver for Interference Suppression", IEEE Journal on selected areas in communications, Vol. 18, No. 8, August 2000, as applied to claim 1 above, and further in view of Bottomley (hereinafter Bottomley II)(US Patent 5,499,272).

Re claim 5, the reference of Bottomley fails to specifically disclose storing the cancellation metric in a memory of the receiver as a pre-configured value.

However, Bottomley II does. (See col. 11, lines 44-48) Bottomley discloses storing the cancellation metric (See col. 11, lines 44-48) in a memory (buffer 602) of the receiver as a pre-configured value.

Therefore, taking the combined teachings of Bottomley and Bottomley II as a whole. It would have been obvious to one of ordinary skill in the art to have incorporated this feature into the system of Bottomley, in the manner as claimed, and as

taught by Bottomley II, for the benefit of suppressing interference in the receiver.

Re claim 6, the combination of Bottomley and Bottomley II further discloses determining the pre-configured value of the cancellation metric by characterizing inter-symbol interference cancellation performance of the receiver, or of a same type of receiver. (In Bottomley II, equalization is performed, whereby suppressing ISI.)

Claim 21 is a system claim corresponding to method claim 5. Hence, the steps performed in method claim 5 would have necessitated the elements in system claim 21. Therefore, claim 21 has been analyzed and rejected w/r to claim 5.

Claim 35 is a system claim corresponding to method claim 5. Hence, the steps performed in method claim 5 would have necessitated the elements in system claim 35. Therefore, claim 35 has been analyzed and rejected w/r to claim 5.
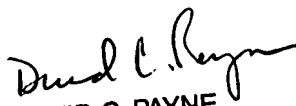
Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Flores whose telephone number is 571-270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LF
April 17, 2007

DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER